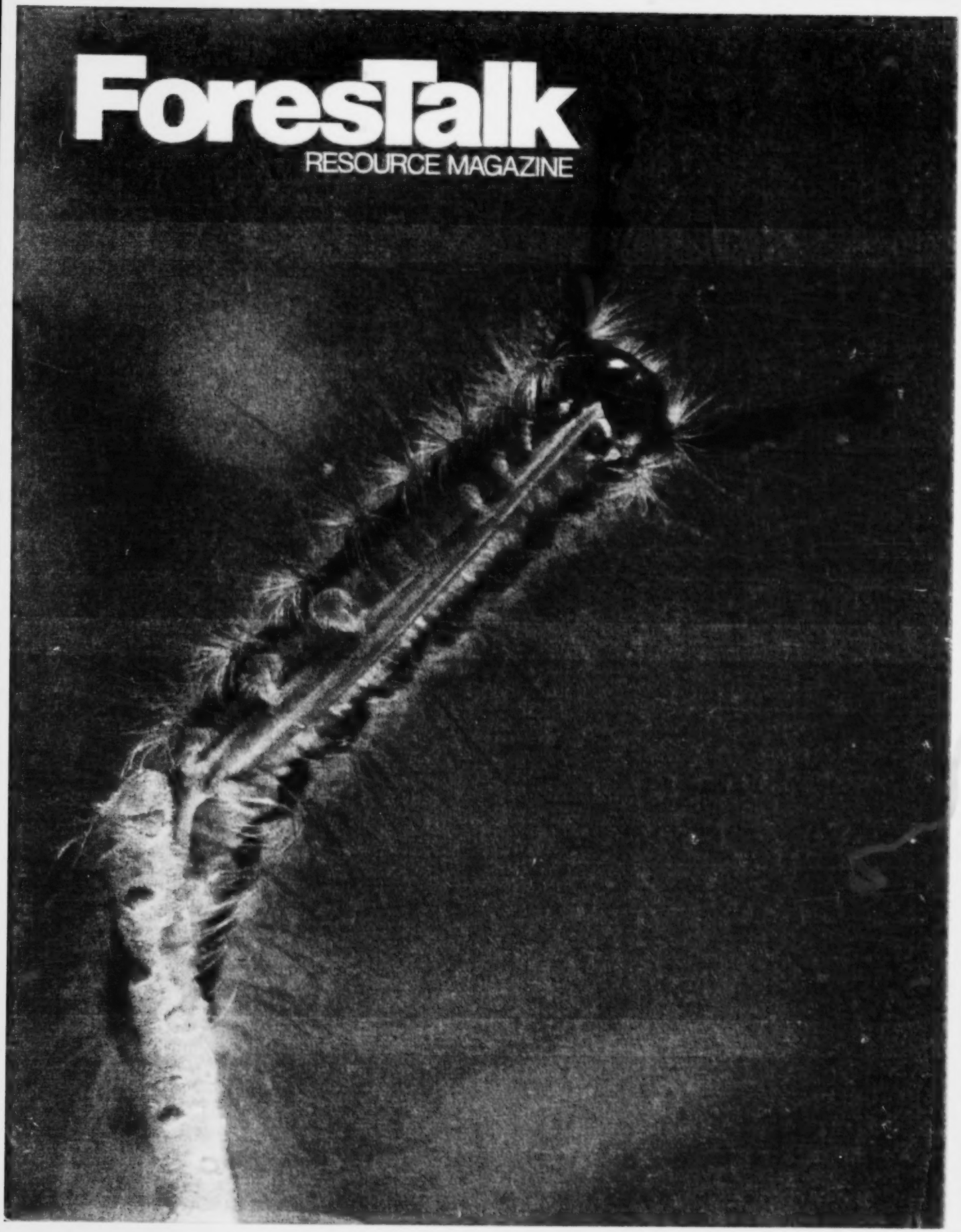
ForesTalk

RESOURCE MAGAZINE



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ForesTalk
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As this edition goes to press, we are already planning the next three issues. We have pooled our own ideas and we've consulted with other resource agencies. That leaves one very important source to be considered: you, our readers. Since our prime purpose is to inform you, drop us a line and let us know what you think of ForesTalk and how it might be improved. We wish to acknowledge and thank the hundreds of people who have taken the time and trouble to write us, offering their views and suggestions. Your past response has led us to include a 'letters' section and 'Forest Habitat', a new feature depicting types of wildlife living in the forest.

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Publisher **Hugh Lyons**
Editor **Garth Coward**

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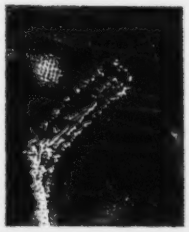
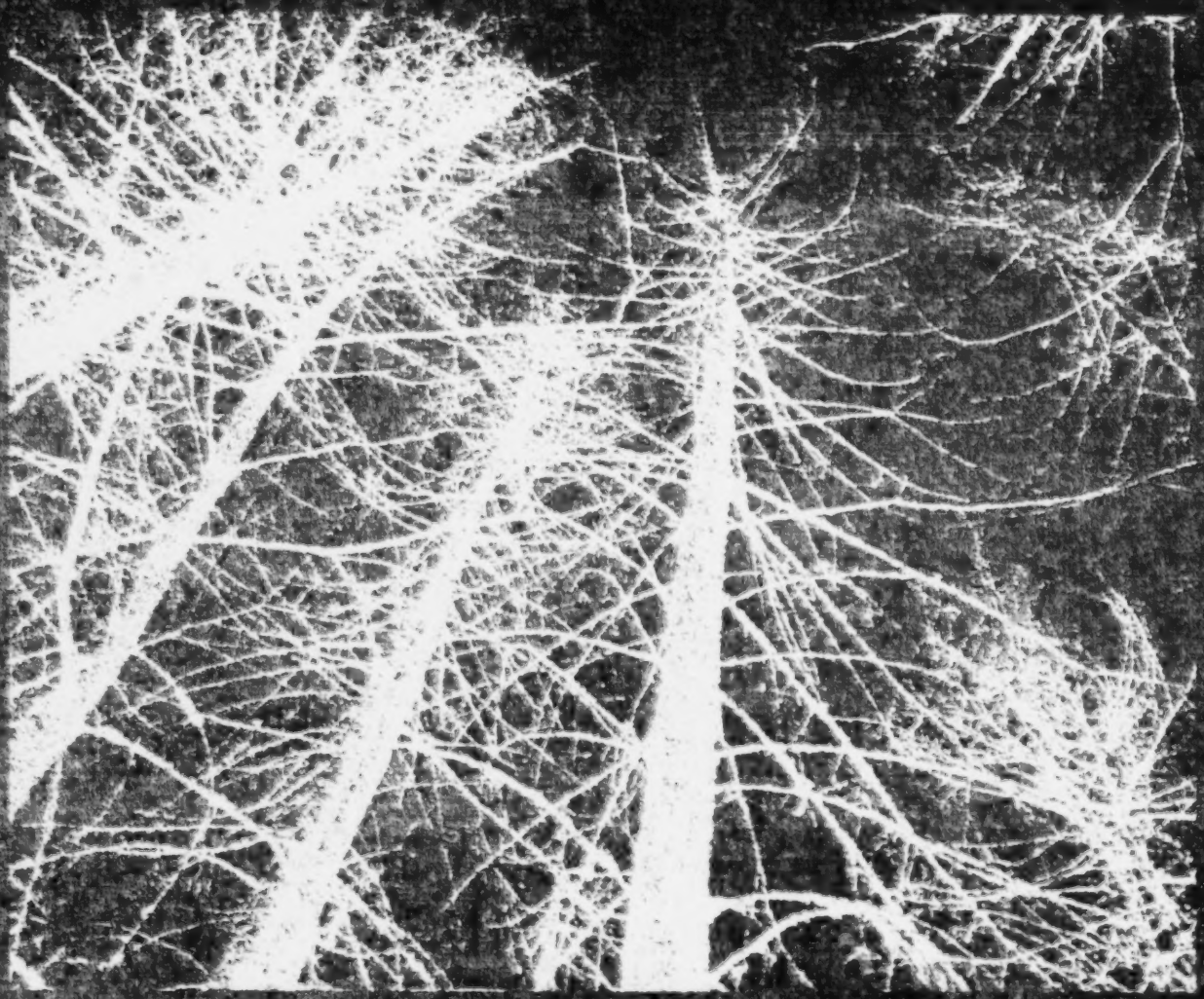


Cover photo, taken by Rob Salmon, illustrates the striking appearance of the Douglas-fir Tussock Moth. We still do not completely understand what causes nature to unleash the destructive forces of insects.

INSECT INVASION

by Gerry Graham

Through a long and turbulent history, the forests of British Columbia have become the number one social and economic factor in the province. If it happens in the forests, it happens everywhere. Good and bad markets, management/labour exchanges, political policies, technology, expansion and depression are some of the influences we have subjected the forests to and they have survived. But one aspect of forestry no one has any control over is nature. Since the beginning of time, nature has been the ultimate ruler of the world and 1977 is no exception.



The latest in the historical chain of forest crisis is something most people don't often relate to: insects. The main problem is infestations of western spruce budworm and mountain pine bark beetle. Our most immediate concern is the budworm.

The budworm is a defoliator. It eats the needles and buds of Douglas-fir, balsam, alpine fir and white spruce. It is not known what causes an outbreak, how far it will spread, or how long it will last.

In southern British Columbia, the greatest budworm concentration exists in the forests from Hope through the Fraser Canyon to Lillooet and stretches from there to Pemberton. It also reaches south into Manning Provincial Park (see map). There are some large concentrated outbreaks northeast of Kamloops. The total area covered by the budworm is 600,000 acres. The beetle covers another 400,000 acres. The situation is very serious.

HOW THE BUDWORM WORKS

The adult is a small brown moth but in its larval, or caterpillar stage, is when the destruction takes place. Despite its name, the spruce budworm does not restrict its eating habits and is attacking stands of Douglas-fir in the areas mentioned.

The moths emerge in the summer months, generally during July and August, and lay their eggs in masses on the undersides of the tree's needles. Tiny larvae emerge in about 10 days and spin silken hibernation shelters in the crevices of the bark, under bud and bark scales. The larvae remain there until the following spring without feeding.

The overwintered larvae emerge in the first warm weather, usually just before the new vegetation appears. Then the destruction begins. Under loosely spun protective shelters, the larvae consume new bursting buds, thus destroying the tree's ability to produce new foliage.

During this time, the larvae molts four times, becoming bigger and consuming more with each molt. If all the new foliage and buds are consumed, the insect will then eat all the foliage from previous years. The adult moth emerges in July or August and the cycle starts all over again.

The occurrence of insect attack is generally found in mature and over-mature stands. But once there is an outbreak, it takes in younger trees within the area and this is where the problem is centred. If a stand is over-mature, its value, not only in dollars, is diminishing. It's near the end of the life cycle. Life will be drained either by natural death, disease, fire or, as in this case, insects. The worry now in our local problem is the loss or reduction in growth of future forests.

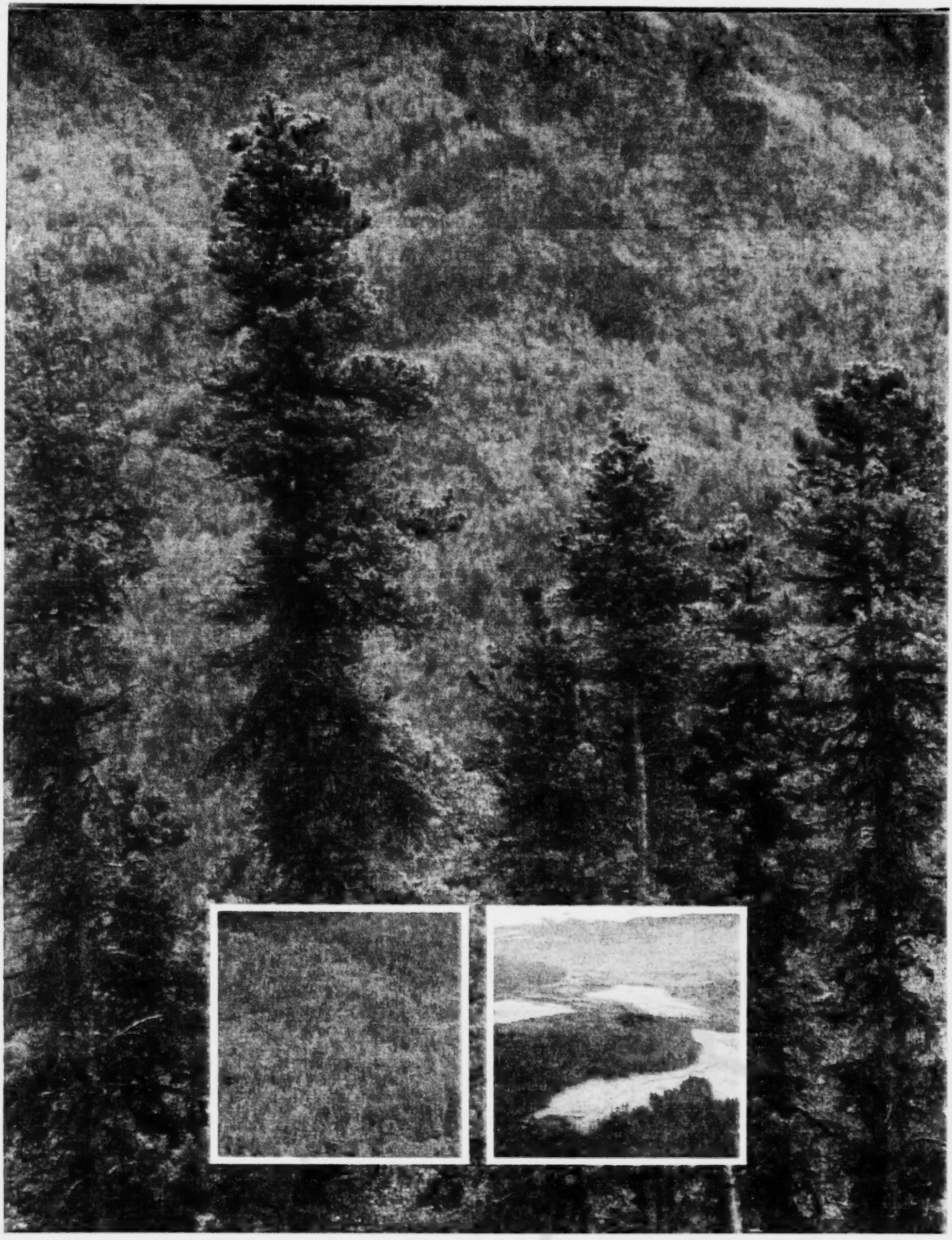
DEALING WITH THE PROBLEM

Since 1989, the Forest Service has been aware of the infestation and with the help of the Canadian Forestry Service, has been monitoring the spread of this insect attack. Since the problem of insects is cyclical, there was little indication that it would grow to the present proportions. In its natural cycle, the insect appears, causes some havoc, then dies its natural death within a certain time period. This time there is evidence that the outbreak

(opposite page)
Once trees are attacked by the bark beetle, the needles turn brown and death soon follows. A quick harvest is still the most effective means of reducing beetle population.

(below)
As an adult, the spruce budworm is a small brown moth, but it is in the larval or caterpillar stage that each insect eats hundreds of newly formed needles in its short six-week lifespan.

Breeding in both fallen and standing timber, the bark beetle excavates an egg gallery between the bark and the tree's outer sapwood.



will not subside. Therefore, decisions must be made. The alternatives are limited.

The Forest Service has appointed George S. Nagle, a forest economist, to produce a cost benefit analysis of the problem, with the objectives of outlining alternative solutions and their effects on the economy and environment. Answers to be determined and recommended this spring so action can be taken this summer. The public will be kept fully informed.

THE BIOLOGICAL SOLUTION

Attempts to reduce the budworm population by introducing naturally occurring virus diseases have not been successful, although this method has been used most effectively with other insects such as the Douglas-fir Tussock Moth.

THE DO NOTHING APPROACH

The second option would be to do nothing. Let the insect take its course. In this case, some of the stands would be salvagable and logging operations would have to begin shortly. The objective would be to remove as many infested trees as possible.

The advantage here would be enhancement of local employment for a short period. But the whole district is mountainous and many of the stands are inaccessible. Some of the stands can be salvaged, but the remaining trees will still hold larvae which can spread again to other stands. Many trees in the inaccessible areas would certainly die, becoming a fire hazard. An uncontrolled fire in this area would be catastrophic. There would also be the risk of losing the retaining capabilities of the slopes resulting in slides, erosion, and eventually, run off problems affecting fish and wildlife habitat and the quality of water.

Aside from those factors, there exists another long-term problem of unemployment resulting from the loss of timber and reduced growth in new forests.

These are the main considerations to be taken into account when looking at the option of doing nothing. Another point is that no one knows when the outbreak will die its natural death. It could be soon or it could linger on for years. In eastern Canada, massive flights of the budworm have been recorded as far away as 50 miles from their known infestations. If we decide on this option, how much further will the infestation spread?

The New Brunswick experience is Canada's most publicized example.

SPRAYING IS ANOTHER OPTION

The only other approach to the problem, which is now being studied, is the use of an insecticide by means of an aerial application, or in everyday terms, a spray program.

The thought of a spray program does not appeal to most people because of experiences in eastern Canada, especially areas like New Brunswick. This is understandable.

WHAT HAPPENED IN NEW BRUNSWICK

The New Brunswick experience is Canada's most publicized example. The history of the budworm in that province started in the early 19th century. The latest attack began in the late 1940's and spread its destruction to cover more than 12 million acres by 1973.

Forests make up a great portion of the New Brunswick economy. The problem is that commercially viable forests consist of very few species. To lose any one species would spell economic disaster. Other provinces have more diversity in their forests and can stand to lose one species for a year while the rest take up the economic slack.

Therefore, the spray program in New Brunswick was designed to protect foliage and keep the trees alive. This meant spraying each year early in the larvae development of the budworm reducing the population but not eliminating it.

They have been spraying every year since 1951, and because of claims that certain additives used with the insecticide "Fenitrothion" cause environmental side effects, New Brunswick's program has become extremely controversial.

RELATING TO OUR PROBLEM

British Columbia's budworm problem is very different. If the decision is made to spray, we would spray only once. The objective would be to control the insect population rather than protect the foliage. The spray would be applied late in the larvae stage, thus eliminating the insect population, but this year's damage would already have taken place.

'Orthene', a material used successfully in some parts of the U.S., would likely be the spray selected. It has a low toxicity and will break down in a very short period of time, and there is minimal danger of any residual effects.

Any spray program would be concentrated in one area for the first year and monitored to see if there were any noticeable effects, then continued in other stands until the insect is eliminated.

If this insect infestation continues, the very real problem we are now faced with will spread to proportions that make the current situation look small. The area around the Fraser Canyon is too highly populated and inaccessible to allow the possibility of uncontrolled fires. One lightning storm is all it would take to ignite the dead timber.

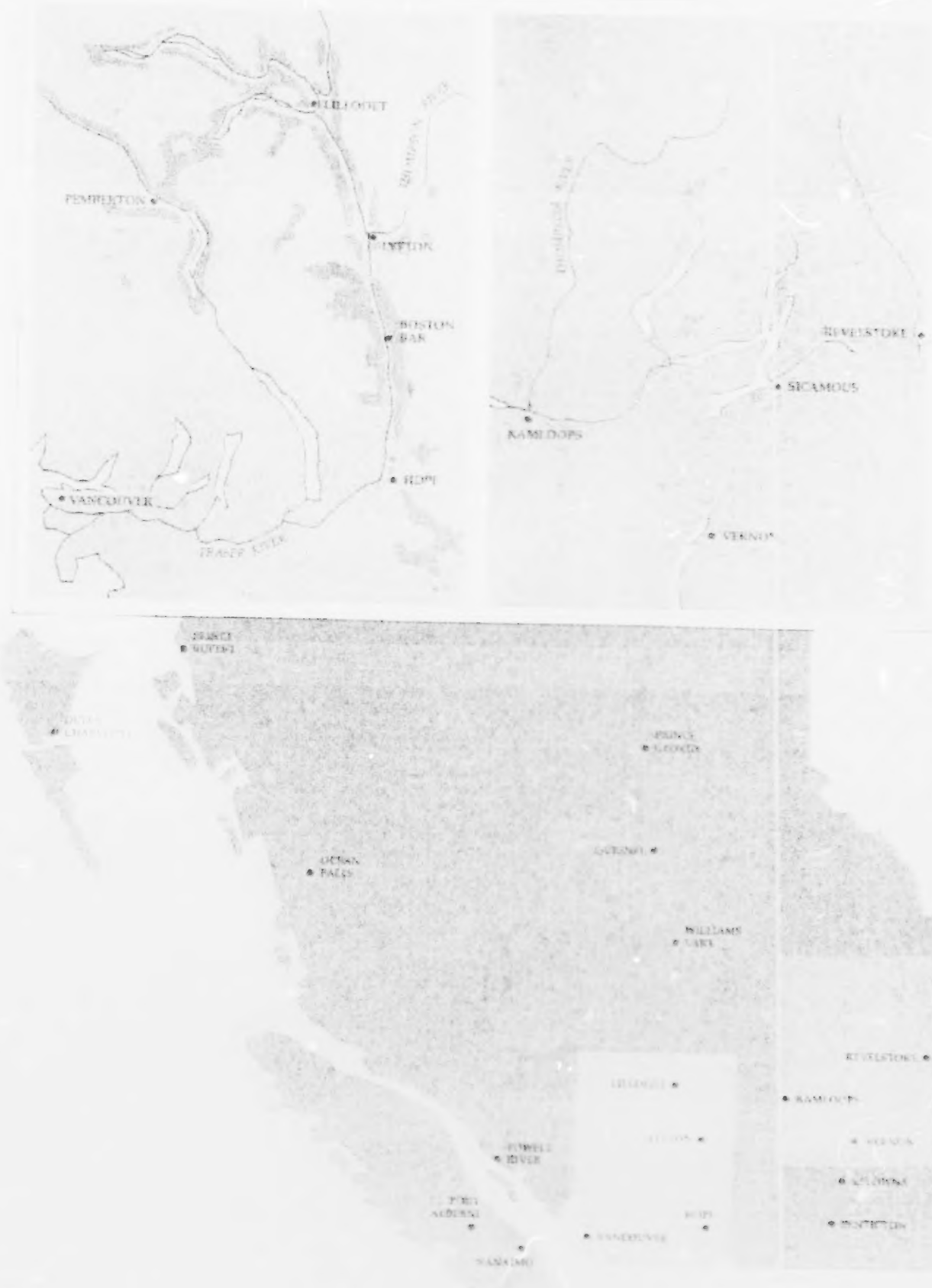
Timing is so tight that preparations are now being made for all possible options including controlled spraying.

If a controlled spray program is used, especially in the steep mountainous areas where we are experiencing the most severe problems, the application would have to be by helicopter. Application is easier to control from a helicopter than fixed-wing aircraft. This reduces the prospect of the spray drifting into areas where it could cause environmental damage.

Any spray program proposed would be reviewed by the Forest Pest Review Committee, which is made up by representatives from both the Federal and Provincial Governments, industry and individuals.

In addition, any pesticide application in British Columbia must be approved by the Inter-departmental Pesticide Committee which includes biologists, foresters, agrologists, hydrologists, and a medical doctor. Their objectives are to "insure that the right pesticide is applied at the right time, under the right conditions, by qualified personnel with the proper equipment". If it doesn't pass this committee, it doesn't happen. Spraying must be carried out under the right conditions, meaning that the air must be calm, rivers and other waterways should be avoided.

The options are limited. But understanding the options and their effects on the economy and environment will determine the best route to take. The results of the study undertaken by George Nagle will soon be ready. A decision is expected by early April.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PRINCE RUPERT
PRINCE GEORGE
QUESNEL
WILLIAMS LAKE
KAMLOOPS
POWELL RIVER
PORT ALBERNI
NANAIMO

The Stein Basin Stuck

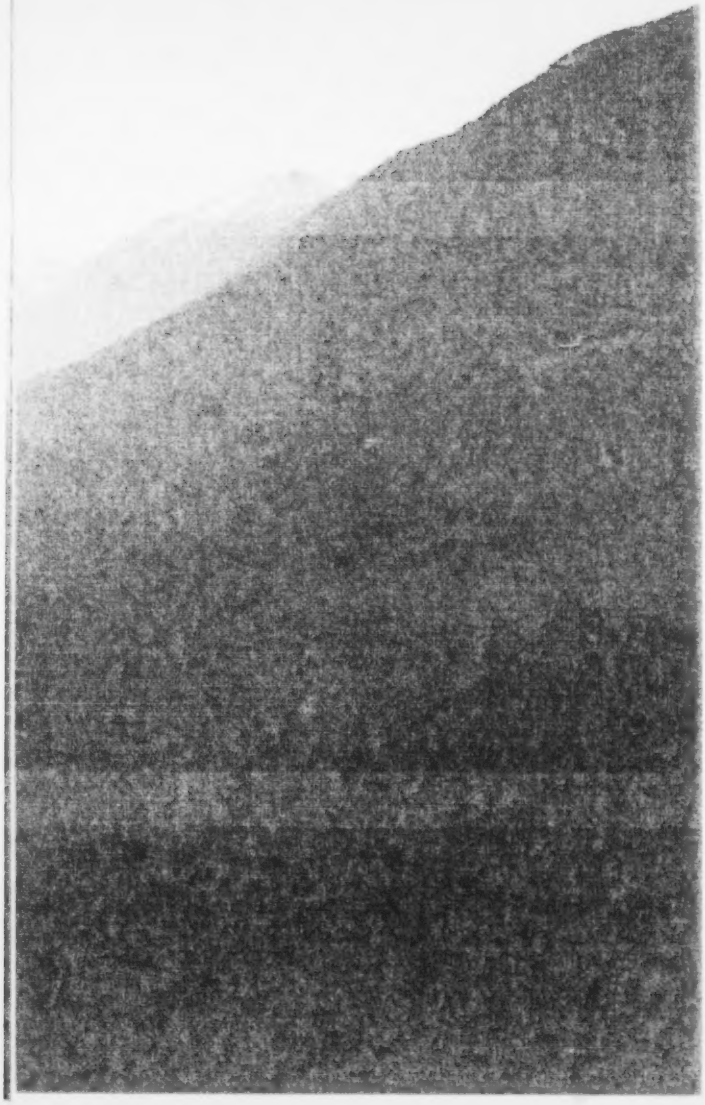
by Marnie Huckvale

The Stein River Basin is 265,000 acres of virtually untouched forest located west of Lytton. Its particular significance lies in it being one of the few untouched areas within driving distance of the Lower Mainland, and it has come to public attention in recent months because of the government's decision to allow some resource development within the area.

This resource development versus unspoiled wilderness controversy is not new. It happened over the Skagit River valley. It happened on the Eastern Slopes in Alberta. With an increased interest in environmental protection, any resource development has been looked upon by the extremists as rape of the landscape, and often, even by the moderate protectionists, as unnecessary spoiling of recreational land.

The government, and or industry on the other hand, usually find themselves having to define the development of new resource areas

As yet untouched, the velvet green splendor of the Stein River Valley is a photographer's paradise.



in terms of jobs, dollars and cents — which inevitably makes them the villain in some people's eyes. The preservationists speak of ruining the natural habitat of woodland animals, and the government speaks of income from forestry. Both sides may have valid arguments.

The first storm of controversy over the Stein Basin came in 1973 when the Forest Service was studying the potential of opening the area to development. Despite the fact that for several years the basin had comprised 15 per cent of the total volume of the Botanie Public Sustained Yield Unit and the Forest Service was within all guidelines in suggesting multiple-use development for the area, opposition to the move led the provincial government to place a two year moratorium over the area in February, 1974.

Study Made Public

The Stein River Basin Committee, with representatives from the Forest Service, Mines Branch, Parks Branch, Fish and Wildlife Branch and the Provincial Archaeologist, was established to study and make recommendations about future use of the basin. The final results of their study were released by the provincial government on October 25th of last year.

The report stated, in essence, that resource development would take place in the Stein Basin — on a limited scale and over an extended period of time, and making every effort to balance the need for development with the preservation of the environment. The Stein, in other words, would not be completely protected. The area would be opened not just for logging and mining operations, but for planned recreational activities. Since the announcement, public meetings have been held, and interested environmental groups have attempted to sway the decision to proceed with development.

To understand the significance of the Stein Basin controversy, it is necessary to know something of the area itself. The Stein catchment area is composed of the Stein River, two major tributaries, and a series of minor tributaries. The basin ranges in altitude from 600 to 9,500 feet and has spectacular natural scenery which ranges from broad valleys to alpine meadows to the Rutledge Glacier in the southwest part of the area.

There are no roads into the area, except an extremely marginal mining road and a horse trail. The rivers are largely steep-sided and interspersed with canyons and "white water" areas. While the basin is a naturalist's paradise,

it is not at present accessible to the average person. And while it is in proximity to the Lower Mainland and does offer a unique natural wilderness, only an estimated 100 people visit any part of the basin each year.

The major opposition to development is that it will destroy the unique wilderness character of the basin. As far back as 1973, Ray B. Mason, past president of the B.C. Mountaineering Club, said in a brief to the government, "There are no lakes under 2,500 feet in altitude within 100 miles of Vancouver that have not been logged to the shorelines, dammed, or both.

There is only one major valley within 100 miles of Vancouver that has not been logged, flooded, or both. Only one. It is the valley of the Stein River".

Proponents of development agree that it will alter the wilderness aspect of the basin, but they point out that the Headwater Lakes and Cottonwood Creek areas have been permanently reserved for their scenic values. However, on the totally practical side, the report states, "Though the Stein does indeed offer many attractions, it is doubtful whether the extremely high development costs entailed in opening it up for recreation could ever be justified by the use which the area would receive. Even after the construction of an access road 80 miles into the drainage (at a cost in excess of $1 million), the headwater lakes would still be a two day hike away".

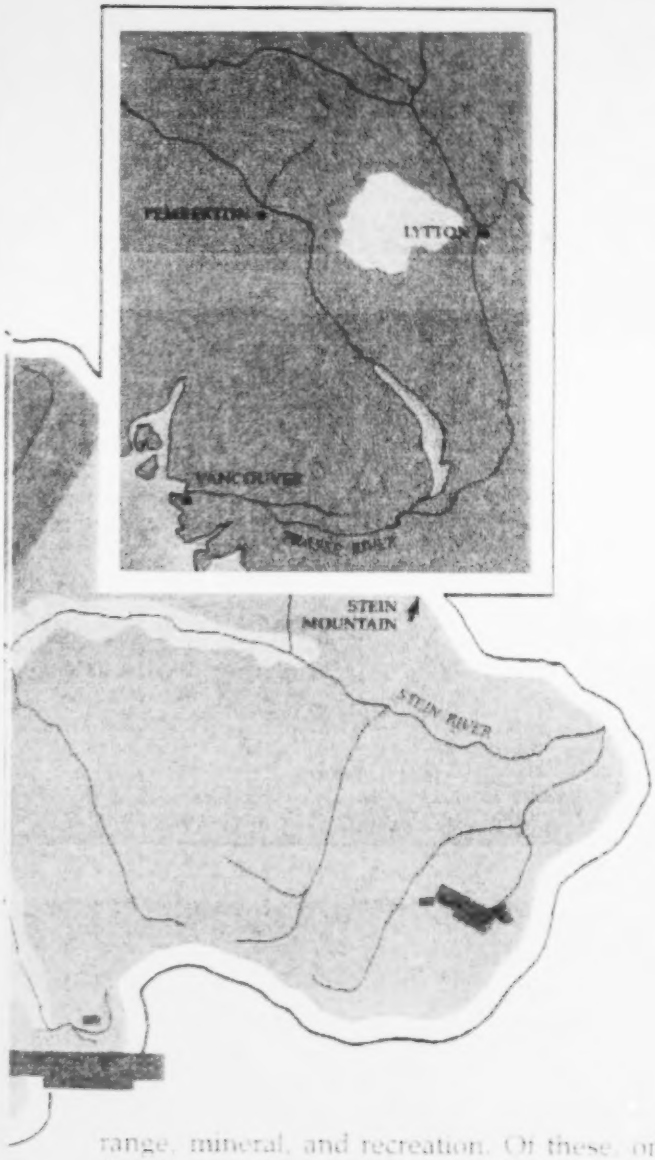
In making the Stein Basin Study, the significance and interaction of seven resources were considered: forestry, fisheries, wildlife, archeology (there are a number of sites having great archeological significance within the basin).

Winter food supplies for birds and other wildlife are plentiful near Stein Lake.

Mineral Claims

Accessible Area for limited forest resource development

Permanent Recreation Reserve Areas



Cottonwood Creek offers the same alpine beauty found in the Stein Valley.

range, mineral, and recreation. Of these, only the forestry resource was discussed in terms of dollar value. It was suggested in the report, that developing the forestry resource as recommended would result (if given economic and market conditions were met) in income of $74.7 million dollars over a 30-year period. The value of the mining potential has yet to be estimated and the other resources do not lend themselves too readily to dollar figures.

In essence, the study recommended, and the government agreed, that the basin area be managed to "achieve optimum return from its timber potential within the constraints of an intensive planned forest folio system". Specifically, this means:

- forest harvesting will take place in 9% of the drainage area over a 30- year period.
- sensitive sites and visual environment will be protected.
- a system of recreation sites will be developed.
- a high standard of road construction will be set and enforced to minimize environmental impact and logging operations will stress cable yarding and high lead systems.
- the Headwater Lakes and Cottonwood Creek areas will be permanently reserved from harvesting and preserved for recreational use.
- all mineral development will be under strict environmental control.

Despite the assurances that water quality and wildlife habitat would be protected, and that large areas had been set aside for recreation purposes, several environmental organizations have continued to protest the opening of the Stein Basin to development of any sort. And, since any development in the Stein River Basin is probably several years away, with some people the controversy will undoubtedly continue.

At present, it is not economically feasible to begin any logging operations in the area. There is the possibility that it never will be. But until harvesting operations begin, 100 people a year enjoy the spectacular and still virtually untouched Stein River Basin.

HEWERS OF WOOD
DRAWERS OF WATER

by **Gord Price**

In the tropical Third World, adequate disease-free water is the critical commodity of life. In Victoria and Vancouver, where water is so abundant, so clean and clear, so thirst-quenchingly good, we tend to take it for granted. The people of Victoria and Vancouver can thank great reserves of forests few of them have ever seen for their good fortune, forests that guarantee all the pure water they need or are likely to require well into the next century.

On Vancouver Island, thanks to remarkable forward-thinking moves on the part of Victoria's early city fathers, the Greater Victoria Water District owns two watersheds outright, Sooke and Goldstream, to the west and slightly north of the city. They are almost the same in area as the urban core itself, and are capable of serving a population that the Capital Region may never reach until the 21st century. A drought would have to be unrelieved for over a year before Victoria began to seriously run out of water.

The Greater Vancouver Water District has a licence lasting a millenium on three watersheds to the north of the city — Capilano, Seymour and Coquitlam — that can provide each of its million consumers with over 300 gallons of water on summer's hottest day.

Because of history, Victoria and Vancouver have single-use watersheds. The 34,100 acres of Victoria and the 144,640 acres of Vancouver are devoted to producing water of the highest quality as their first priority; all else comes second. The rest of the province, however, draws water from lands and water courses shared with other users.

While the Forest Service remains in charge of activities within the provincial forests, the Water Investigations Branch and the local health officers monitor water quality when used for domestic supply. If the quality degrades to the point of potential hazard to health, the Minister of Health may take corrective action. But since 1970, the Forest Service's folio system allows those concerned with water quality in community watersheds to comment before adverse changes occur.

It's the opinion of many watershed managers charged with providing the best water at the cheapest price that their task would be considerably eased if community watersheds were restricted for single-use purposes. But for most of the towns and villages in British Columbia, that simply isn't possible.

"I doubt whether the forest industry could operate if we shut down logging in the Okanagan watersheds," said one resource manager in the Water Resources Service. "Some cities like Penticton actually exploit the recreational use of their watershed. Vernon, for instance, has a ski resort in its catchment area which is an important part of the winter economy."

The trade-off required is increased surveillance and sanitation to ensure that the water meets the criteria set out in the "B.C. Recommended Water Quality Standards", which is in turn based on the "Canadian Drinking Water Standards" — the bibles of water managers.

It's not surprising to find that the staffs of the Victoria and Vancouver water districts which have historically had closed watersheds, argue forcefully for the maintenance of restricted access and single use on their lands, since their water meets the highest standards 90 per cent of the time in Vancouver and 100 per cent in Victoria with only modest chlorination and without expensive filtering.

"We don't have any problem assuring people of water quality because we know everything that goes on in the watershed," explained one of the Vancouver water district staff. "The whole system can be kept coliform negative with very small doses of chlorine, not noticeable to the taste. If people were allowed in on an unrestricted basis, the possibility of pathogens from fecal contamination that can cause water-related diseases means we would have to increase chlorination, surveillance, and put in a filtration system at considerable cost — perhaps reflected in a doubling of your water bill. And it would mean a price more than money; it would mean a change in what people are used to when they drink the water."

Yet both the Vancouver and Victoria water districts have discovered to their profit, a devotion to water quality does not mean the exclusion of proper forest management and harvesting. Unfortunately, before the water districts were established in their present forms, both watersheds had been ravaged in part by badly supervised, incompetent logging that wasn't stopped until the 1930's. While nature demonstrated her resiliency with healthy stands of second growth, the memory of destructive exploitation lingered on, discouraging modern silvicultural management until quite recently.

Curiously, it was on the recommendation of the late Dr. E.A. Cleveland, the Chief Commissioner of the Vancouver water district, that encouraged Victoria's water district to operate on sustained-yield principles in 1949. Yet on the forestlands he managed for Vancouver, Cleveland ruled out any logging at all. It wasn't until after his death that the Greater

Restricted access helps Vancouver avoid chlorination and expensive filtering systems

Vancouver Water District got into the business of forestry. In 1961, an infestation of balsam woolly aphid required the salvaging of snags for both economic and safety reasons. Since then, forest management has played an increasingly important role.

In Victoria, activity was restricted to inventory and cleanup during the early 1950's due to the closed-door ethic of the city mayor who headed the water board. It wasn't until 1957 when a new board discovered the cost-defraying potential of logging income from its valuable stands of timber that operations expanded rapidly. But because of their desire for flexibility, the water board insisted that all forest management, including falling and road building, be handled internally. Consequently, with a permanent staff of three to 25 loggers, plenty of heavy equipment, two nurseries and a 1977 budget of $1,174,000, the Victoria water district's forestry division easily outrivals the four-man staff in Vancouver, where all logging is contracted to truck loggers.

And though the combined area of Vancouver's three watersheds is four times the size of Victoria's two, there's no contest. Victoria has the superior forest. Eighty-five per cent of Victoria's watershed is Douglas-fir, compared to Vancouver's eight per cent. As well, its stock is split roughly half and half between immature (under 120 years) and mature cover, whereas 73 per cent of Vancouver's forest is mature, and, of that, about four-fifths is overmature.

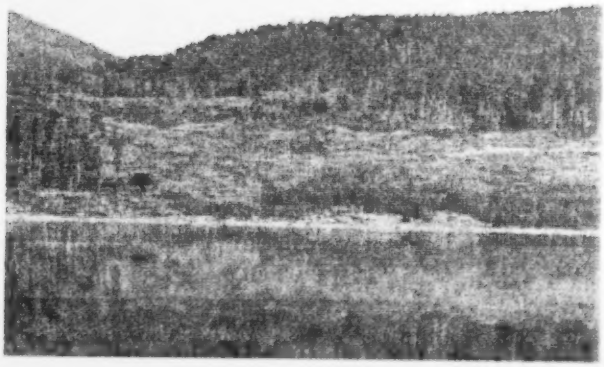
Because of the difference in quality and age of forest, it's not surprising that Victoria also has a better return from its logging operation. This last year saw a net profit of about half a million dollars added to the general treasury of the Greater Victoria Water District, enough to return $10 to each consumer by way of a smaller water bill. Vancouver realized about $100,000 from its logging operations, but the figure isn't really comparable with Victoria since Vancouver must pay stumpage to the provincial government, for it operates under an agreement similar to a Tree Farm Licence. Victoria pays only forest protection and logging taxes.

Despite these differences in size, forest cover and procedures, both water districts have identical attitudes about the role of logging and forest management.

"The word I want to stress is caution," emphasizes Vancouver water district forester Kel Blakeney. "Forestry is a secondary objective here; water quality comes first. We want to be on a safe footing, and so we don't even take our full annual allowable cut (AAC). The actual cut is about three million cubic feet a year, just a little over half the AAC calculated by the Forest Service. By logging only 300 acres a year in small patches rarely over 70 acres, there's no difference caused in the water regime. With the kind of rainfall we get, a heavy runoff on exposed slopes could be disastrous."

Caution is the key. If improperly done, logging can increase erosion and sedimentation, causing turbidity in the water courses. Turbidity is simply an increase in the amount of particles in the water, which may seem more an aesthetic problem than anything else. But in fact the consequences are more severe. The purpose of chlorination is to disinfect the water by eliminating the bacteria and viruses which cause disease. But particles of dirt can harbour the bacteria, making the chlorine ineffective and requiring the installation of filtering systems at considerably greater expense to duplicate something the watershed and reservoir provide naturally.

Logging roads can be the main cause of erosion, so great care is taken



to their construction. Vancouver is examining the possibility of skyline logging, an old idea becoming fashionable once again, to avoid the building of roads altogether on steep slopes.

Some hillsides may never be logged because the potential erosion is too great a threat.

The most sensitive and conservative logging in British Columbia is practised in the great urban watersheds. And that's reflected in the money spent on silviculture as well as in the foresters' attitudes. In the last decade Vancouver has spent $155,000 on researching hydrological effects alone and is presently conducting basic studies on two small watersheds in the district so that future logging impacts on water outflow and quality can be measured — the only study of its kind in this type of forest.

In Victoria, the high silvicultural standards are reflected in the million-dollar budget and the rigorous precautions taken to protect the newly-planted seedlings. Fencing is actually strung around the harvested acreage until the trees are of sufficient height to withstand the browsing deer.

Both watersheds use high-lead logging techniques on small patches of clearcut that vary with the topography. Vancouver alternates the cutting in its three watersheds, with Capilano scheduled for the next harvest. Victoria concentrates on overmature, blowdown and damaged stands.

Reforestation is always prompt and complete, with success rates as high as 95 per cent not uncommon.

Slash burning is carefully handled. Vancouver prefers to broadcast burn in the wetter spring; Victoria piles and burns for greater control.

Although the dangers of logging are recognized, the benefits are substantial. Roads provide access, a vital aid to fire protection, and they allow the monitoring of mountain lakes and water flows more frequently. The revenue from the timber helps defray consumer costs while contributing to better management. And the need for disease control that first motivated the Greater Vancouver Water District to begin forestry still exists.

Evidence to date indicates that logging has not resulted in a deterioration of water quality, and since forestry has been effectively integrated into watershed management, why not allow other uses, ask some, who point to the rest of the province and eastern North American water districts.

In fact, the watersheds are not as closed as people think, although they're well-guarded and patrolled to prevent unauthorized entrance. In Victoria, hunting is permitted under licence for part of the season in the Goldstream section from which about 20 per cent of the region's water comes. In Vancouver, licensed fishermen are permitted part way up the Seymour River below the dam, and various forms of recreation, skeet and pistol shooting, hiking and skiing, are also permitted or tolerated along the border of the 20 square-mile Seymour panhandle which was included in the district when it was thought the reservoir dam might be built 10 miles downstream from its present location.

Because recreation opportunities are abundant elsewhere and the potential threat to health would require disproportionate costs for the advantages gained, unrestricted access to the watersheds is unlikely. As integrated management improves, greater benefits may also be realized from the urban water districts.

In the meantime, the watershed foresters continue what most surely is the most Canadian of occupations: they have work to do, drawing water. ☐

PROTECTING THE FOREST ENVIRONMENT

A PROGRESS REPORT

by Cameron Young

While just about everyone agrees that the forest environment should be managed and protected for all its users, the mechanisms for achieving that objective aren't quite so easily instituted.

The 1976 Report of The Royal Commission of Forest Resources, prepared by its Commissioner, Peter H. Pearse, contains literally hundreds of recommendations for forest management reform. And it seems that nearly every one of these recommendations is sensitive to general environmental concerns. The report itself is based on over a year of public hearings and a vast amount of written submissions from government, industry, and the public. But translating the concerns of the Pearse report into legislation is a delicate and difficult task.

Still, if everything goes according to schedule, a new forest act, based on the report, may be written within the year.

The Forest Policy Advisory Committee of B.C. chaired by Robert Wood, has been charged with categorizing the Pearse report, with developing the mechanics of acquiring necessary data as recommended by the report, and with assessing the possible effects of the recommendations. The committee is the official channel through which the public can react to the original recommendations, and it will recommend to government on the possible implementation of the recommendations.

"It will probably take the better part of the year before we are ready to recommend what should go into the new act," Wood says, "but it may and can be done sooner."

On the specific topic of environmental concern, Wood has this to say: "It was Pearse's concern that whatever policies we came up with, they must provide for environmental protection. That's just as critical as the sawing of a tree."

The idea that the forest environment should be protected and managed for users other than the timber companies is still a very recent one in the history of British Columbia forest management, but once it was established as a principle it developed relatively rapidly. For many people it didn't develop rapidly enough, but as one forester says, "The concept of multiple-use is only 10 years young."

It was only five years ago that Resource Folios were introduced to the province, where logging interests, ecological interests, fish, wildlife and recreation interests are all taken into account before logging operations can begin in a given watershed area. And the Co-ordinated Resource Management Plan, which was designed more for range areas and involves "eyeball to eyeball" discussions among competing groups in a given cutting area, has been in existence less than two years.

It is through these two programs, as well as through the general cutting guidelines that were also developed in this decade, that the forest envi-

ronment receives its formal protection. But because of manpower shortages these sophisticated resource-planning techniques can only be developed to a limited extent. In practice, the most important environmental decisions are usually made at the local level, where company and Forest Service foresters develop a detailed cutting strategy that will suit both industry and the environment.

To prepare a resource folio for a given watershed requires much time and study, not only by the Forest Service, but by various other resource agencies. To prepare a folio for every watershed in the province where cutting is proposed is quite beyond the capacity of the Forest Service, yet it has the largest staff of any of the government resource agencies. For example, the Fish and Wildlife Branch have the personnel to deal with only a handful of folios in a year, while one estimate suggests that over 400 folios are required throughout the province. Fish and Wildlife Branch contribution to each of these is essential.

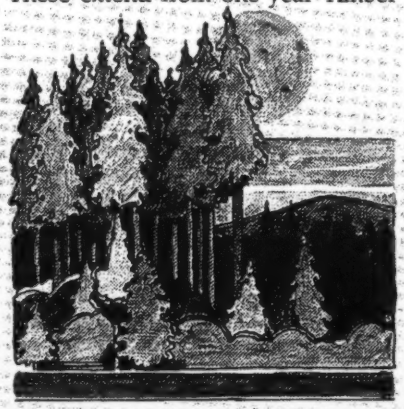
The Forest Service, in recognizing that it can't prepare all the folios it would like to, has adopted an intermediate resource management strategy. It now identifies all potential logging sites (sub-units) for the next five years and categorizes them into environmental and social impact classes of major, moderate, and minor. In this way the Forest Service can concentrate its manpower, as well as the even more scarce manpower of the other resource agencies, on management planning of the more environmentally sensitive areas. Forest operational plans for minor impact areas, which are prepared on the basis of guidelines, are not referred to other agencies prior to their approval by the Forest Service. However, even with this system of giving planning priority to sensitive sites, the Forest Service is still short of personnel to deal comprehensively with every major environmental impact zone.

Another problem arising out of manpower shortages is the difficulty of preparing an adequate forest inventory. This in turn makes it difficult to prepare proper environmental impact studies, and may lead to dangerous miscalculations in the yearly allowable cut in a given area.

To overcome this problem the Forest Service has recently reorganized its inventory procedures, and now there is a special inventory program designed specifically to identify Environment Protection Areas (E.P.A.). This might include "red-flagging" a whole forest unit with erosion problems; or an important fish and wildlife habitat; or a unique recreation area; or whatever.

Then, when the annual allowable cut is calculated for an area designated as an E.P.A., the count would be lowered as much as 90 per cent. The "red flagging" also alerts any resources planners in the area to be especially environmental conscious. In fact, a Class I E.P.A. classification means no logging should occur there at all.

Another condition that detracts from good environmental planning is the land tenure system in the province. About 95 per cent of British Columbia is Crown land, and the forest industry has access to timber on that land through many different and complicated leasing procedures. These extend from one-year Timber



Sale Licences to Tree Farm Licences held for 21 years. About 50 per cent of the total amount of timber cut on Crown land comes from the short-term Timber Sale Licences, and in these cases there is little or no opportunity to develop a comprehensive resource plan prior to cutting.

The Canadian Forestry Service is particularly concerned that under these poorly regulated conditions watersheds just aren't being protected. Robert Wood of the advisory committee indicated that the land tenure systems will be given serious consideration in any new forest act.

Despite acknowledging that the British Columbia Forest Service has been working quickly towards achieving more effective environmental standards, various organizations have numerous criticisms of the present structures of protecting the forest environment. Both the Parks Branch and the Environment Land Use Committee Secretariat, in their submissions to the Royal Commission, stress the point that proper protection of the forest environment for all its users demands a more comprehensive land-management program. They indicate in various ways that a true multiple-use concept cannot pre-suppose that forests are primarily for industrial use, with all other users getting to use what is left.

The B.C. Wildlife Federation echoes a similar view, saying that forest management must be based on what the actual productive capability of the land is (recreation, fish and wildlife, aesthetics), and not solely on what industry desires that productive capability to be.

The Sierra Club recognizes that site-specific resource planning, along the lines of the folio system, if implemented would be ideal. But in the interim, until the manpower situation allows for that kind of detailed planning, the club would like protective legislation for environmental values. As a working model for what they have in mind they refer to legislation in the United States that currently takes into account the detailed resource requirements of all users of the forest.

The Forest Policy Advisory Committee is well aware of all the environmental criticisms, and Robert Wood himself admits that "multiple-use is a bit of flat wheel right now". On the other hand, the committee is not likely to forget that 50 cents on every dollar in the province is generated through the forest industry. Nor will they forget that in 1976 the forest industry employed 85,000 people.

Still, all the criticisms of current forest-management procedures were finally given a focus by the Pearse Commission, and now the advisory committee is hearing reactions to the report before preparing recommendations for the new forest act. The committee is obviously faced with a delicate task of trying to balance off competing concerns, to rectify inadequacies in multiple-use resource planning without alienating the forest industry.

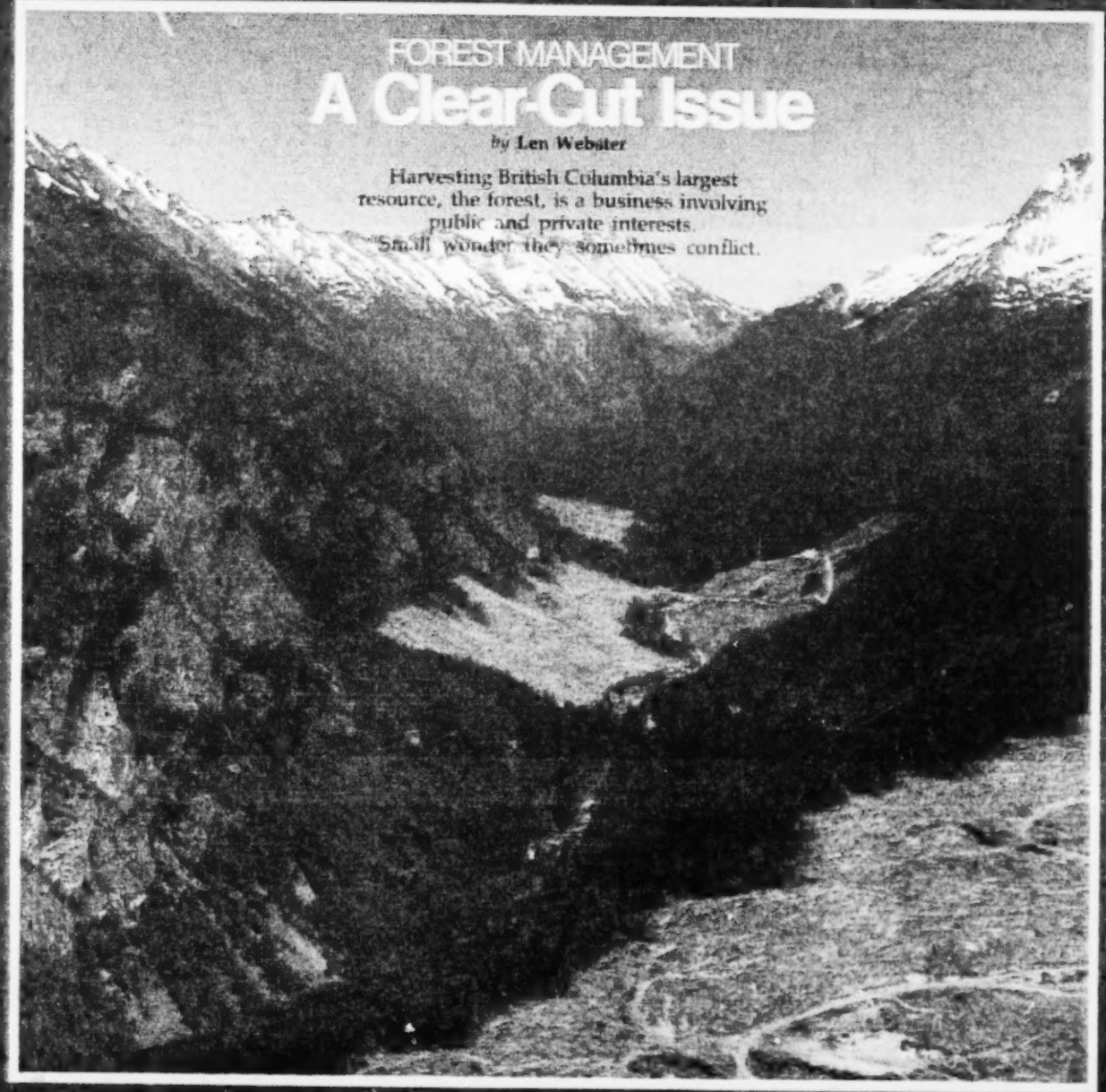
But the changes in the last 10 years that have brought more protection to the forest environment are likely to be continued, for as Robert Wood says: "Commissioner Pearse made it clear in various parts of his report that the demands of the public about environmental concerns must be accommodated.

FOREST MANAGEMENT

A Clear-Cut Issue

by **Len Webster**

Harvesting British Columbia's largest resource, the forest, is a business involving public and private interests. Small wonder they sometimes conflict.



Cresting a rise or rounding a bend, one of the most dramatic sights to come upon is a hillside stripped of its trees. The naked stumps, tangled brush, and scars left by logging equipment is an affront to the senses. We expect and want to see lush greenery and gentle slopes — what confronts us is devastation.

What we are seeing is really the results of harvesting the trees that have reached maturity — that are ready to be cropped. Although much more dramatic, this is the same as harvesting wheat, and actually involves techniques similar to those used by any farmer.

What we sometimes see are the remains of harvests cropped without thought for the future, of well-intended experiments that didn't quite work and, perhaps surprisingly, the scars left by preventive surgery —and the raw tissue caused when nature shows her other face and abruptly completes the cycle of life.

DOOMED IN THE END TO DIE

It is not a pleasant thought to acknowledge that eventually, all the trees in the forest are doomed to die. Some will complete a full life cycle from seedling to decaying hulk in as little as 70 to 80 years; others will live for hundreds of years — a special few a thousand or more. But their lifespan is finite. And they will each pass through stages of young sapling, mature tree and overmature giant.

Left to itself, and provided no natural catastrophy takes place — like fire, flood, avalanche, insects or disease — the forest will gradually progress to a state where life is only just sustained. This is the climax forest, and is more common in the west coastal regions than in the interior zones.

The climate forest: a dense, almost impenetratable mass where sunlight hardly ever reaches the ground, and where new growth struggles for sur-

vival amidst the rotting and diseased remnants of fallen trunks and matted undergrowth.

With an outer veneer of apparently healthy foliage, the climax forest is a fire waiting to happen, a disease about to spread — and still. Still like the world had stopped. Wildlife, even birds are infrequent.

And yet all the ingredients for healthy, sustained growth are there in the climax forest, trapped in the soil that is buried under layers of debris. Seeds, nutrients, moisture: all that is needed to produce the next generation of trees.

Should a fire occur and clean out the rubbish, this new life will spring up almost overnight. First the fireweed which needs the nitrogen available in the ashes of the fire and the light that can now penetrate to the forest floor. Then, progressively, the weeds, creepers, flowers and grasses until, in due course, the young trees begin to appear.

Within a decade, the scar is hidden. Young trees thrive and cloak the ground with vigorous, healthy growth. Fifty, seventy, ninety years later the trees will mature according to the species, and from that point on will begin the decline into decadence that results in the climax forest.

HARVESTING THE FORESTS — A MATTER OF TIMING

Cutting trees and removing them for conversion into products is the process of forest harvesting. Except for the vast difference in time scale, it is very similar to harvesting of root crops, fish, fruit, cereals, etc. Fortunately, we do not have to wait up to a century for corn to ripen or for cabbages to grow.

The best time to cut a tree depends on many things, among them the species, end use, availability, growth pattern and rate, location and elevation, and so on. In a well-established mixed-age-class forest as exists in parts of the B.C. Interior, in eastern Canada and in many parts of the U.S., it is possible to select individual trees throughout an area to be harvested during a season. Several years later, other trees would be chosen and cropped.

On the B.C. Coast, however, such forests exist mainly in a few low-lying areas. Even there it is sometimes hardly economical to practice selective cutting. Also, such repeated intrusions by heavy equipment for harvesting operations can do significant damage and possibly inhibit much new growth.

For these and other reasons, clear-cutting — the removal of all similar-age trees from within a given area — is the more common practice in the coastal forests and is becoming more common throughout the province.

SOME DAMAGE INEVITABLE

While the scars left following clear-cutting are the most obvious signs, other damage occurs no matter what system or technique is used, nor how infrequently the area is worked. More recently, emphasis has been placed on techniques designed to minimize any adverse environmental impact.

The damage comes from a variety of causes, and has a number of effects. In the interior, for instance, much logging is done with large tracked equipment. The generally smaller size trees and less volume to the acre, plus a more favourable terrain means that vehicles equipped with a large metal arch can be used to pull a number of logs each trip on short hauls over skid roads leading to landing sites. These sites, where the logs are loaded onto huge trucks, are connected by the relatively few roads that have to be developed through a logging area.

On the coast, where the slopes tend to be much steeper, it is very common to use skyline or high-lead yarding — a method of collecting logs using a high spar to support lines used to pull the logs to a central area for loading. Of necessity, this method required the development of more truck roads.

Because the forest floor can consist of a delicate balance of soils and other materials essential to the healthy growth of vegetable matter, even occasional passage by heavy equipment

Nearly finish of mature trees produces the most economical harvesting operation.

can, at some locations, cause damage that might significantly impair future growth. Likewise, removal of tree cover encourages rapid growth of species that might otherwise be inhibited.

The ground, streams, and all vegetable growth are constantly changing and developing environment, however. Forest fire removes the vegetation, avalanche also can significantly affect the top soil, cause streams to silt up, and even alter the course of a river.

Perhaps the argument is not whether logging should be allowed but how forestry practices can be administered to cause least environmental impact.

NO GARDEN OF EDEN

Because the forest environment is constantly changing, the various elements making up that environment also alter. Wildlife, for instance. It is pleasant to think of deer and elk, squirrels and birds all flitting, gliding or gambolling under a sun-dappled leafy canopy. Ideally, that's possible, but the average is much less like Disneyland.

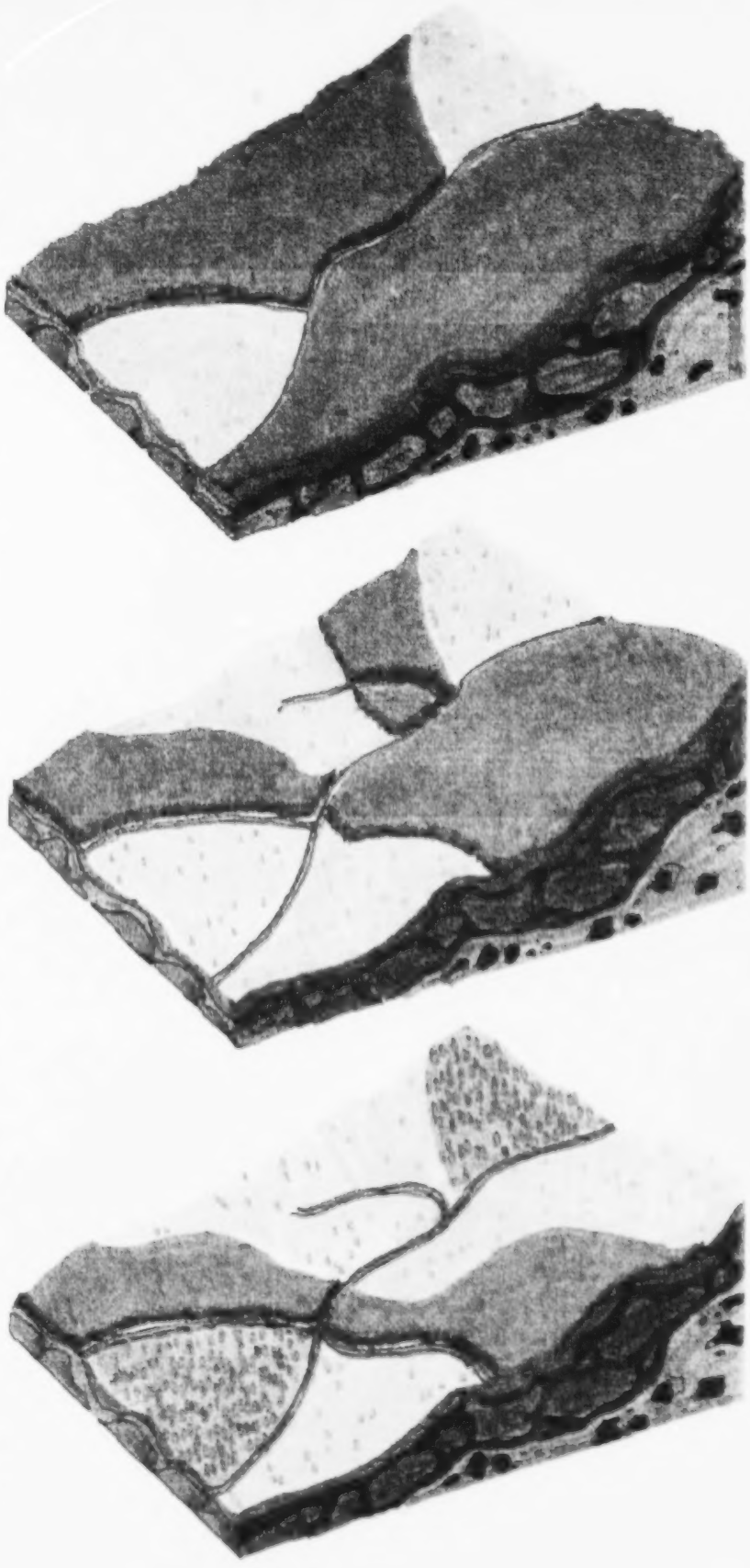
Wildlife survives in the forest according to a complex and interlocking set of checks and balances — availability of food being one of the most important. For grazing animals, young trees and saplings are a prime source of food, but the time when any tree can provide sustenance for grazers can be as little as five per cent of its total life span — much less with some species.

The climax forest offers extremely limited opportunity for wildlife of many kinds. Whereas a well-managed system of irregular-shaped and uneven-aged clear-cut lots will, as they progressively grow in, provide a variety of conditions and abundant cover and food for a wide range of wildlife.

There is even an argument that clear-cutting promotes an increase in deer population — sometimes, it is speculated, to a point of overpopulation. More recent physical surveys and actual animal counts suggest that the population natural at the time to an area remains relatively constant but that the animals tend to congregate in the uncut areas, producing a highly localized apparent increase.

Perhaps one of the areas giving rise to most concern is for the fish and other aquatic life. Not only could removal of shade trees immediately ad-

Clearcutting in carefully planned patterns over long periods of time produces a mosaic of different-aged stands. Fire protection forests and wildlife corridors surround the clearcut areas, creating a balance of diverse conditions in which all forms of wildlife can thrive and prosper.



jacent to slow-moving streams and rivers permit an increase in water temperature, which may significantly alter the living and spawning habits of the fish, but it has frequently been noted that development of logging roads, skidding trails and almost any other change to the forest carpet tends to promote silting of the stream beds.

Both of these points, plus many others, are taken into account in the guidelines to which all forestry operations must comply. Year by year these guides are modified as new circumstances are identified, and ways are found to prevent old ills.

Yet natural disasters have time and again ravaged valleys and clogged rivers and streams with muck and debris. Massive fires of incredible intensity have burned not only all vegetable matter, but even the soil itself, turning it into a clogging, drifting ash. And still the fish populations have returned. Still, given sufficient time, the land has healed, new growth has sprung up, and a new balance of fish, animals, birds and insects evolved.

PRACTICAL ALTERNATIVES

If we are to continue to derive social and economic benefits from our forests — and not even the most extreme activists have yet advocated total abstinence — then the ways in which we harvest the trees are limited.

We can, do and should continue to define certain limited areas as forest preserves. Whether it is for their natural beauty, wildlife, tree species or any other socially valid reason, such areas are now excluded from logging, and are mostly maintained and nurtured by various agencies of the federal and provincial governments.

There are other areas which should

perhaps, never be logged — or if they are cut, should be treated with special care. Areas such as very steep, rocky and possibly remote slopes, or where the soils are particularly sensitive to disturbance. Cutting above a certain elevation, too, has often been questioned. While such timber is very expensive to obtain, and even though replacement seedlings are difficult to plant and have a very long growing cycle to maturity, there are those who say the timber should be taken and the economic benefit to all derived.

The banks of rivers, streams and creeks are also areas of special consideration. For each site is different. In certain cases, logging is allowed down to the water's edge. Other sites require a leave strip be left alongside rivers and streams, and only highly selective logging tolerated in the immediate vicinity. More extensive and intensive harvesting being permitted further away from the water.

PLANNING FOR FUTURE HARVESTS

Key to the whole problem is planning — and the provincial government, as well as private industry, has evolved various alternative plans over many years of practical forestry experience.

While the principal public responsibility for such planning rests with the Forest Service, a number of other agencies are also actively involved. Over the years, progressively more strict guidelines have been developed and forestry companies are monitored to ensure compliance.

Unfortunately, like any broad framework, not all the rules fit all the circumstances, and examples of bad logging can still be found. They are becoming less frequent, however, even on those lands over which the Forest Service has little jurisdiction due to the granting of logging rights long ago, before the present system of licencing was introduced.

At first glance it would seem a simple task just to write some regulations about logging, and then to make sure that all forestry companies obeyed the rules. In real life, almost every stand of trees is unique and presents a different set of problems. Only recently has it been fully recognized what a marked difference to rate of growth is made by even small variations in soils. To properly allow for this in planning future logging operations would mean the detailed inspection, analysis and mapping of every square yard of the millions of acres of commercial forest in the province. Already, more than 80 per cent of this area is under sustained yield management — which means some form of clearcutting. The remaining acreage, for the most part, has not yet been designated for logging.

There is increasing attention being given to the size and shape of plots scheduled to be cut. Today, wherever the aesthetic quality of the land is high, emphasis is put on making the boundaries of blocks designated for cutting fit the contours of the land, taking into account all natural features.

The sequencing of blocks is also given a lot of attention. This is to prevent checkerboarding, and encourage different age trees to develop on various blocks to form a varied forest backdrop, ranging from freshly cut to almost mature.

Already there are many excellent examples of fully managed forests, where the cutting takes into account the shape and nature of the ground, and where progressive regrowth gives variety and contrast to the forest. Inevitably, at some point, there will be areas that are either freshly cut, or which are only just beginning to show the green stubble of new growth as the freshly planted seedlings take hold.

OPTIONS UNLIMITED

Throughout the world, wherever mechanized forestry takes place, the methods developed bear marked similarity. No matter who is responsible, or where, or on what kind of geography in whatever climate, foresters manage in much the same way.

Selective logging — taking only a few trees at a time from amongst the many — or clearcutting — harvesting all similar-age trees irrespective of species within a given area at one time. These are the two options, and the alternatives are simply fancy titles for the same thing.

Mostly, geography and the kind of forest dictates which way to go. And some form of clearcutting is indicated for the great majority of commercial forests throughout the province. The old trees have mostly gone, giants that took several hundred years to grow. Today the woodlands are managed and cropped, and each year sees an advance in the skill with which it is done, producing more wood of higher commercial quality with less impact on the environment and ecology of the area.

The first explorers from the west who sailed the Strait of Georgia saw something of nature's ability to regenerate the forests. Recent tree-stump research indicates that only a relatively few years before their arrival, a fire of huge proportions and devastating intensity swept through more than 200 miles of dense forest down the east coast of Vancouver Island — consuming virtually all the trees, choking the rivers and streams, scorching the soil.

And yet the forest was reborn, the fish returned, an ecological balance re-established. Those first westerners saw hills and mountains that were densely mantled with young, vigorous growth — the juvenile forest that was the foundation on which our present forest industry was laid. Already we are harvesting the second growth since that incredible fire. The cycle of the forest is repeating. Given time, it'll grow.

Letters to the Editor

"I found 'Forestalk' of interest to me . . . it is written in such a way that it not only held my attention and educated me, but it prompted me to respond immediately. I would like to know more about Mr. Howard English and his program. He seems to be the kind of man many of our young people should learn more about. What prompted him to take on the leadership role to re-establish Vancouver Island spawning grounds?"

Bill Duvard
Sardis, B.C.

For more information regarding the Amalgamated Conservation Society write: Brian N. Inglis, President, Amalgamated Conservation Society, P.O. Box 743, Victoria, B.C. V8W 2P6
Editor

"I am disappointed that 'Forestalk' speaks for the forest products industry. I would like to see more 'controversial' and 'conservationist' views expressed. Why don't you start a 'letters' section in the magazine?"

P. Glover
Smithers, B.C.

Our intention is to report to you, our readers, and leave the opinion making to you.
Editor

"I thoroughly enjoyed 'Forestalk' especially the article by Gord Price on the Forest Service Recreation Sites. Short of peeking at Harry Marshall's map in Victoria, how does one go about finding out just where these sites are located?"

Michael Sikula
Vancouver, B.C.

Most Forest Service Recreation Sites are small, with limited facilities in the form of toilets, tables, litter barrels, and firepods. They are located some distance away from public highways, with access via rough gravel roads.

Since most sites are small, and there is no charge, it would be easy to overload them if they were given wide publicity, thereby spoiling the enjoyment of all users. Consequently, we ask that anyone interested in using these sites, direct their requests to the Forest Ranger Station once they have reached the local area. (Check telephone directory under 'Forest Service Ranger' for address and phone number.) Once you visit the Ranger Station, you can get an up-to-date report on road conditions in the woods, the fire-hazard situation, and other helpful directions and advice. At this time, only a limited recreation map coverage exists for the province, but this is being steadily increased to serve local needs as funding permits.
Editor

"We enjoyed the interesting articles and photography . . . as lay people we were surprised to learn of the thinning process going on in the Sayward Forest, and in fact found a wealth of information in the whole magazine."

June Thicke
Ladysmith, B.C.

"We received 'Forestalk' and enjoyed it immensely. Do you have any information on leasing Crown land?"

Violet & David Lovely
Lake Errock, B.C.

A free booklet, titled "Disposition of Crown Lands," explaining how you can obtain Crown land, is available by writing the Director of Land Management, Ministry of the Environment, Legislative Buildings, Victoria, B.C. V8V 1X5
Editor

"I found your magazine to be interesting and very informative . . . it is indeed a pleasure in these times of general distrust of government, to find a government agency willing to devote the time and resources to publish a magazine outlining their programs, accomplishments, and problems . . . again well done and thank you."

C. D. Fleming
Vancouver, B.C.

". . . a very informative and interesting magazine. It has the makings of an excellent method of encouraging public awareness. With the recent settlement of the rangeland division now permanently with the Ministry of Forests, how about an article dealing with range, grazing and the beef industry."

Glenn Heyes
North Vancouver, B.C.

Look for the next issue.
Editor

"Many thanks for 'Forestalk' . . . congratulations to all those involved in its preparation. You've covered many aspects of conservation which have bothered me for a long time, but I still cannot understand why the government has not passed legislation making it compulsory for the forest industry to log no closer than 100 feet from streams and rivers, and to forbid them from damaging the breeding grounds of salmon."

G. F. Peake,
Victoria, B.C.

Having received many inquiries from our readers regarding 'streambank' protection, and because it is difficult, if not impossible, to answer them in a few words, we've decided to cover the entire topic in a later issue (July or October) of Forestalk.
Editor

"Enjoyed reading Forestalk especially the article on wilderness recreation sites. We enjoy camping and feel an article on good camping habits wouldn't do your readers any harm. Often we have to burn garbage other campers leave behind. Another disgusting habit is the number of cans and bottles thrown into rivers and lakes."

Mrs. I. Nolen
North Vancouver, B.C.

"The story entitled 'People Make the Difference' really amazed me. To see so many people working together to restore a small river to where it will produce and support a salmon run again was inspiring.

It would be interesting, to see if something like this could be done to some of the lower mainland rivers and streams which support coho and steelhead before they disappear and never return."

J.A. Nyberg
Surrey, B.C.

"The Sayward Forest article told me that the Forest Service is finally learning something, especially about the number of trees per acre, wildlife conservation and public use. I wish your publication every success."

E. Hallock
Sardis, B.C.

FOREST HABITAT

THE BLACK BEAR

by **Enid K. Lemon**

Lillooet, a small town on the Fraser River, is synonymous with "Ma Murray," the former fiery editor of the Lillooet Free Press, and jade. Very few people would link the area with the killing of 700 Black Bear to make 3,000 shakos, a military hat, for the Royal Guards to wear to the coronation of Queen Elizabeth in 1953. Fortunately for Black Bears, coronations do not happen too often and the life of a shako is about 40 years!

The Black Bear, which comes in various colour phases, brown, dark brown, cinnamon, blue-black and white, is one of our best known mammals. Because of people's foolishness in offering them food, they can become a nuisance at campsites, and must often be moved away or destroyed.

There is something endearing about this animal, probably stemming from the fact that in 1902, President Theodore Roosevelt was on a hunting trip and the party captured a small cub. Some members suggested it be killed, but the president refused and kept it as a pet. This was the original model for the now famous children's "Teddy bear". More than 30 million of the furry toys were sold in the United States alone.

Widely distributed throughout North America, Black Bears prefer wooded areas containing a mixture of coniferous and deciduous trees, with an abundance of vegetation producing berries, nuts, grass, roots, and herbs. Stream areas with spawning salmon are perfect "bear country". Bears are omniferous. They will eat anything that comes their way, including carrion (the "riper" the better) and insects. Wild honey in a tree is a first-class treat.

For most of the year a male Black Bear is a solitary creature, living alone on a well-defined range of about 15 square miles. In the late spring he seeks out one or two females. The cubs, usually one or two in number, are born in January or February while the female is still in her winter den. At birth the cubs are between six to eight inches long and weigh about half a pound. This is only one two-hundredth of the mother's weight. They grow rapidly and are quite active by the time they leave the den with their mother in the spring.

It has been estimated that in primitive times the North American population of the Black Bear was around 500,000. Today it is about half that number. They have few predators to worry about, although cougars have been known to attack and kill; and wolves occasionally attack them. Man is left as the bear's greatest enemy. He not only kills the animals for so-called "sport" but has also made substantial reductions in their range in some areas by resource development and by clearing land for farming purposes.

The attitude of man towards bears has always been one of caution and respect. To the Indians, the bear played an important role in ceremonies and dances. Different Indian tribes had their own beliefs in the powers of the "bear spirit", which in some instances was an important part of their religion.

Both Grizzly and Black Bear were honoured, but the Black Bear, being a smaller animal, was known as "Little Brother".

ForesTalk

RESOURCE MAGAZINE

Province of
British Columbia
Ministry of
Forests